Differentiation of focal liver lesions - Accuracy of contrast-enhanced ultrasound in comparison with CT/MRI in a tertiary Swiss GI center

Mikael Sawatzki

Background:
In prospective multicenter trials accuracy of contrast-enhanced ultrasound (CEUS) for differentiation of focal liver lesions (FLL) is comparable to CT and MRI (1, 2). CEUS is safe and cost-effective without exposure to radiation, risk of renal insufficiency or thyreotoxicosis. Severe adverse effects are very uncommon (0.06 - 0.4%) (3, 4). Our aim was to assess whether CEUS in everyday clinical routine is practicable with adequate accuracy in terms of tumor dignity.

Methods:
We analyzed all CEUS for FLL between 1/2011 - 3/2013 performed by one examiner (level II of training according to European Federation Society for Ultrasound) on one ultrasound device (Acuson Sequoia 512R, Siemens) to avoid interobserver variation. All patients were examined according to international guidelines and good clinical practice recommendations (5) with intravenous application of sulphur hexafluoride microbubbles (SonoVueR, Bracco). Intratumoral contrast enhancement in the arterial phase followed by hypoechoic appearance (“wash out”) in the portal venous or delayed phase was the criteria for a malignant FLL. Group A included all patients with histology as standard or reference (SOR), if not available (e.g. benign FLL) convergent CEUS with multislice CT or MRI (with intravenous contrast application of gadoxetate, interpreted by experienced radiologists) results or follow up (mean 15 months) were SOR. Group B contains patients with histology as SOR.

Results:
In 112 patients between 16-86 years (n=25 cirrhics) no complications occurred after CEUS. Half of the CEUS were performed before CT/MRI. 75 FLL were benign. 37 malignant FLL included 18 patients with HCC, 17 with metastasis, one cholangio-carcinoma and one primary B-cell-lymphoma. Sensitivity and specificity of CEUS were 96-97.2% and 84.2-90.6%, respectively (figures 1 & 2). CEUS could not classify only one HCC (MRI and histology positive) as malignant FLL (respectively excellent sensitivity 96-97% and negative predictive value 94-98% (NPV). In contrast (CT/MRI) could not identify three metastasis, one HCC, one peripheral cholangiocarcinoma and one primary lymphoma (6 false negative results with NPV 78.9-89.8%). All these malignant FLL were correctly classified by CEUS (figures 3-5). Benign FLL were
diagnosed slightly more accurate by CT/MRI with a specificity

Conclusions:
In our setting CEUS is practicable with no adverse effects and good accuracy for differentiation of malignant or benign FLL. CEUS is not inferior to CT/MRI, can avoid false negative results by CT/MRI and improved sensitivity. CT/MRI can avoid false positive results and improved specificity. Therefore CEUS should be used complementary with CT/MRI.

type conference paper/poster (Deutsch)
name of conference EASL (London)
date of conference 11-4-2014
title of proceedings Liver tumors
pages 1
publisher J Hepatology